EVALUATION, APPRAISAL, AND STAFF STUDY GUIDE

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(ABC-220)

November 1996

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CHAPTER 1. INTRODUCTION

1. General. This guide provides information and guidance on planning, conducting, and following up on evaluations, appraisals, and staff studies in the agency.

2. Benefits. The Federal Aviation Administration (FAA) is responsible for managing its resources effectively and efficiently while striving to achieve its goals and objectives. Because continuous improvements are necessary in any system, the agency must find ways to determine how well it is achieving program goals and managing its resources to make improvements where needed. Reviews, such as evaluations, appraisals, and staff studies, are tools for providing agency managers and staff with the information needed to make such assessments.

3. Reference Guide. This guide is a reference for agency evaluators and analysts and will be used by individuals in different organizations. The procedures described in this guide are intended to provide general information, including a discussion of the theory of research, as well as practical steps that are common to evaluating and studying all program types. Therefore, readers should use this guide according to their own needs.

4. Format. This guide is arranged in chapters and sections, which are followed by appendices. Terms used in this guide are defined in Appendix A. Samples of suggested formats for a prospectus, an evaluation report, and a staff study report are provided in Appendices B through D. A copy of Order 1800.2G, Evaluations, Appraisals, and Staff Studies, dated October 3, 1996, is provided in Appendix E.

CHAPTER 2. BACKGROUND

1. General. The agency has maintained an evaluation program since 1962. Staff studies have been conducted in the FAA since 1963. Since that time various changes in responsibility and reporting have occurred. However, the agency has continually emphasized the importance of relying on evaluations, appraisals, and staff studies to tell us how well we are doing our job and to identify where we can improve our services and products.

2. Authority. In April 1995 responsibility for developing and issuing policy and guidance on the agency's evaluation and staff study programs was placed within the newly formed Office of Business Information and Consultation (ABC), within the Office of the Assistant Administrator for Administration (AAD).

3. Legislation. In 1993 the Government Performance and Results Act (GPRA) placed increased emphasis on program evaluations for use in establishing and revising an agency's goals and objectives and measuring an agency's performance. To this end, FAA organizations were directed to establish linkages between their programs and their intended outcomes to determine the efficiency, effectiveness, and overall value of those programs.

4. Single Reference Document. Due to the similar nature of the various reviews conducted in the agency (evaluations, appraisals, and staff studies), we prepared this single reference document for use by evaluators and other analysts.

CHAPTER 3. EVALUATIONS

Section 1. General

1. General. An evaluation is a formal line or staff management assessment of the effectiveness of programs and activities under their direction, measured against specific program objectives, technical standards, and administrative policies. Therefore, the purpose of an evaluation is to measure the outcomes of a program against established goals as a means of contributing to subsequent decisionmaking about the program and improving future programming.

2. Program. A program is a unique collection of people, physical resources (facilities, equipment, and supplies), policies and technologies, which by their integrated operation (organized set of activities), produce an output (a good, service, or capability) that tends to achieve one or more of the responsibilities assigned to an agency (its objectives).

3. Purpose of Evaluations. Evaluations are conducted periodically for one or more of the following reasons:

o To determine the effectiveness or efficiency of programs and activities.

o To verify compliance with established policies, procedures, and practices.

o To address the quality of services and products being provided to internal and external customers; whether costs being incurred are worth the results being achieved; the adequacy of existing policies or the need to adopt new policies, and whether the termination of an existing program or activity would be beneficial.

o To establish a linkage between programs and their intended outcomes in accordance with the requirements of the Government Performance and Results Act of 1993.

o To promote continuous improvement in processes and operations.

4. Conduct of Evaluations. Evaluations are to be conducted in such a manner as to ensure their objectivity, accuracy, thoroughness; and to reflect the needs of the customer.

5. Evaluator Goals. Evaluators should think of themselves as consultants. Evaluators are in a position to influence managerial or organizational decisions; however, evaluators have no direct power to make changes or implement programs. The primary goals of evaluators, as consultants, are to:

o Establish collaborative relationships. This arrangement ensures that evaluators will maximize the use of all participants' time and distributes responsibilities.

o Provide solutions to problems, if asked. An evaluator should work with program managers to ensure that the causes of problems--and not merely the symptoms--are addressed. As consultants, evaluators should act as managers' partners. Maintaining open and honest communication with the affected managers is one key to an effective evaluation program.

6. Evaluation Phases. There are six phases of the evaluation process:

o Planning. The individual or team responsible for performing the evaluation meets with the customer to determine customer expectations and identify evaluation objectives, select the methodology, and agree on a format for the evaluation product. The evaluators also determine specific resource needs, select and assign specific tasks to team members, and develop a prospectus or charter. The charter should be signed, at a minimum, by the customer and the evaluation team leader.

o Developing the Methodology. The evaluation team determines the most logical procedure for collecting and analyzing the data needed to answer the questions posed in the evaluation. The evaluation team will establish a timetable or schedule for conducting the evaluation.

o Collecting the Data. The team collects the data required, in accordance with the objectives of the evaluation. Data can be obtained through various sources, such as records, interviews, and questionnaires.

- Analyzing the Data. Analysis of quantitative data usually produces descriptive findings, such as measures of central tendency and the range of responses. Analysis of qualitative information produces descriptive findings, such as the typical response or the diversity of responses. Analysis of the data collected enables the team to draw conclusions.

- Writing the Report. The team communicates the results of an evaluation through the final report, which contains the team's findings and recommendations.

- Followup. Organizations develop a methodology for following up on planned improvements.

Section 2. The Team Format

1. General. Evaluations are often conducted by teams. The team approach offers the following benefits:

o The evaluation process can be reduced by drawing from existing and varied expertise among team members;

o Members have an opportunity to learn from each other;

o Members can build networks for future organizational problemsolving or other similar efforts;

o Recommendations from a team can be more acceptable to a customer; and

o A team format offers a neutral, objective environment for problemsolving.

2. Skills Needed on Team. The evaluation team needs to include a variety of skilled persons who can make a serious commitment to serve on the team. In selecting a team, it is important to tie specific requirements of the evaluation to the resources required to complete each stage. For each focus area, the team leader should determine how many and what type of personnel are required, when they are required, and how much time the evaluation will require. In making these determinations, consider the following positions and their necessary qualities:

o Team Leader. This individual leads the team and should have experience in project management. Good communication and analytical skills are also required.

o Analysts. Individuals with good interviewing, analytical, and communication skills are essential to the team. A general understanding of the methodologies employed, independence from the studied activity, and a creative mind that is open to change are all necessary for these analytical positions.

o Functional Area Specialists. These individuals must have extensive knowledge of functions affecting the issues under review, as well as strong analytical skills and openness to innovation and change. Economists and psychologists, for example, are trained to perform particular types of analysis that are often part of an evaluation.

o Subject Matter Experts. These individuals have extensive technical knowledge needed to implement the evaluation project plan. For example, safety inspectors and air traffic controllers can offer special technical expertise to an evaluation team.

3. Team Advantages.

o Membership on an evaluation team can be an opportunity that benefits participants. Team members work on issues outside their areas of expertise, which may be useful to technical experts who are interested in broadening their experience. Working on a program evaluation can provide training in management skills and techniques--observing how a program is managed, identifying common pitfalls, and learning how to resolve problems. Being on an evaluation team also offers visibility in the organization and the agency. As part of the evaluation process, team members may participate in briefings to and interviews of senior executives. Team members are able to make personal contacts in other parts of their organization or other parts of the agency. They can learn how other programs are solving problems and call on these new contacts for information and advice.

o Working on a team decreases the time required to complete an evaluation. Questions that are based on detailed knowledge of the program activities will be better written and will make sense to the people being interviewed. Outside evaluators require a substantial amount of time to familiarize themselves with the program, and team members add specific experience, as well as historical knowledge, and personal contacts within the organization. They may know where certain data can be found or about the existence of reports, and they can use their contacts to obtain them quickly.

4. Team Credibility. A team that includes members of the program being evaluated increases the credibility of the conclusions. The managers and employees may be more accepting of a report written at least in part by someone they know and who understands the program from the inside. Evaluation depends upon persuasion, not assertion, and team members can personalize the message in their organizations.

5. Outside Consultants. Some evaluation designs will demand a level of expertise that is not available within the organization. In these instances, consultants can be brought into the process. In rare cases, portions of the design can be performed under contract by specialists in highly technical areas.

6. Team Recruiting. Recruiting team members may be a formal or informal process. The team leader may solicit suggestions from the program manager or request that certain individuals be made available. In selecting team members, the team leader should look for people who are flexible and open-minded. The objective is to create shared responsibility and a shared investment in the outcome. It is crucial that those individuals recruited are able to serve as team members for the duration of the evaluation.

7. Ethics. Evaluators must be sensitive to the ethical dilemmas they may encounter, such as those stemming from conflicts of values and roles inherent in program evaluations. The following general guidelines for ethical conduct should be followed by evaluators:

o Respondents, program participants, and persons whose files are being reviewed as part of the evaluation must all be treated with honesty and respect. Evaluators may have access to sensitive and confidential information that must also be protected. Therefore, upon initiating an interview, evaluators should explain the level of confidentiality the evaluator can provide to avoid misunderstanding.

o Collect sufficient, valid, and relevant data to afford a reasonable basis for judgments and conclusions.

o Avoid conflicts of interest when selecting and assigning team members, scheduling field visit locations, gathering data, and analyzing results. Team members who work for the program being evaluated must balance their loyalty to the program with the need to be objective. They must also question their assumptions and biases, keeping an open mind.

o Safeguard sensitive information to prevent unlawful or unethical disclosure and to protect the privacy of people involved.

o Carefully store, distribute, and destroy evaluation data and reports.

o Present factual data impartially and fairly. Ensure that conclusions are fully supported by data.

o Write objective reports with a balanced perspective. Evaluators' objectivity can be threatened when they form relationships with program managers. This may occur naturally in the course of an evaluation. Such a friendship can be a benefit or a liability, depending on the strength of the evaluator's professional ethics. Evaluators, therefore, should be aware that their objectivity and critical judgment are inevitably affected by these relationships.

o Be alert to indications of fraud, waste, abuse, or illegal acts. Adhere to the law.

Section 3. Planning an Evaluation

1. General. Good planning is the cornerstone to an effective evaluation. Attention to evaluation design will help ensure effective use of resources and the performance of a useful, quality evaluation.

2. Evaluation Design. A careful, sound evaluation design increases the strength of findings and recommendations, decreases vulnerability to methodological criticism, and improves customer satisfaction. A good evaluation design can be recognized by the way it has dealt with the following critical issues:

- o Timing projects to prevent problems, rather than correcting problems.
- o Defining the evaluation questions for study to address user needs.
- o Developing a strategy for obtaining answers to those questions.
- o Formulating a data collection plan that anticipates and addresses the problems that are likely to be encountered; and
- o Developing an analysis plan so that the questions are answered in a timely and economic way.

3. Effective Design. Effective evaluation design is:

- o Preventive,
- o Contains costs associated with resource needs,
- o Ensures timeliness,
- o Produces strong, specific findings,
- o Gives direction and purpose to the evaluation, and
- o Addresses users' needs.

4. Purpose of Evaluation. When planning an evaluation, it is important to ensure that the purpose of the evaluation is clearly defined. Examining a program or activity requires understanding its operations and identifying the factors that affect operations. How a problem is stated has implications for the kinds of data to be collected, the sources of data, the analyses that will be necessary to answer the question, and the conclusions.

5. Key Focus Areas. Evaluators cannot answer all questions about a program's organization and operation but must focus their efforts on issues that are timely and useful to customers. The key focus areas are those that both the program managers and the evaluation team agree are feasible and useful to pursue. Steps that the evaluation team should follow to review key focus areas of the evaluation design are discussed below.

6. Brainstorming. The evaluation team can use several methods to develop a range of questions. Brainstorming about a wide range of potential questions will strengthen the confidence of the evaluation team and management in the evaluation design. For example, in considering program objectives, the evaluator could ask questions about the clarity of those objectives, the criteria that have been developed for testing whether the objectives are met, the relationship between the objectives and program goals, and whether the objectives are understood by those responsible for the programs' implementation.

7. Consult Managers. After the evaluation team has compiled a list of questions, they should discuss them with the program manager. Managers should have extensive knowledge about their programs and should be able add valuable information pertaining to the design of the evaluation. The program manager can help the evaluator decide which questions can be answered easily and which will be more difficult, expensive, or time-consuming to answer. This process of review and consultation enables the evaluation team to strongly defend the choices of questions to be addressed. Involving the manager makes him or her an integral part of the evaluation process.

8. Alternative Approaches. Once a set of questions is established, the evaluation team can consider different approaches to answering them. Just as many questions can be used to address the general purpose of an evaluation, several approaches can be used to answer evaluation questions.

9. Evaluation Constraints. The following constraints to the evaluation process are possible and should be considered in the planning stage:

o Time and Schedule. The time available for an evaluation and the scope of the questions being addressed should be directly related. The evaluation team should ensure that they fully comprehend the scope of a study in order to set up a reasonable timeframe for completing the evaluation and reporting the results to the customer.

o Location, Facilities, and Equipment. The location of the program sites to be evaluated may create challenges. When there are many or very remote sites, the evaluation team should include local staff members. When this is not possible, the team should use mail surveys or telephone interviews instead of personal interviews, or incur travel costs. In turn, travel costs influence how many or which sites are visited. Availability of facilities and equipment may limit both the kind and the extent of the data that can be collected. For example, if the evaluation involves analyzing data by computer, the evaluation team must have access to both equipment and technical expertise to manipulate the data. If it is unavailable, the team should consider another design.

o Skill Requirements. Staff expertise is a constraint both in terms of the kind of specialists that are needed and their availability. The team leader should determine how many and what type of staff members are needed for each phase of the evaluation, when each will be needed, and for how long. Some designs may demand a type of expertise unavailable in the organization. In these instances, it may be necessary to educate existing team members or bring contractors into the team.

o Budget. Cost is a constraint for all evaluations. The team must design the number of questions, the means of data collection, the number of sites visited, and the extent of the analysis to conform with the funding available.

o Labor Relation Issues. Many employees of several large programs, such as air traffic control, airway facilities, and flight standards, are unionized. Working with labor union members is not inherently different from working with other employees. Specific collective bargaining agreements often have provisions relating to the conduct of surveys, interviews, and any review process. The evaluator must comply with these requirements. Union representatives must be notified in advance of a pending evaluation. In addition, surveys and questionnaires that will be used to collect data must first be reviewed by union representatives. Evaluators must convince labor representatives of the objectivity of the evaluation because they are also stakeholders in the evaluation process. Union representatives often conduct informal program evaluations on their own and can be useful sources of information.

10. Design Review. Once an evaluation design has been selected, the team leader should review the design against the following factors:

o Appropriateness. How appropriate is the design for addressing the issues posed in the evaluation? The evaluator should be able to show that key questions are being addressed and explain how they will be answered. Serious consideration should be given to whether the design should be implemented or whether the questions should be modified. This judgment is critical because, if the study begins with an inappropriate design, it is difficult to compensate for this error later.

o Adequacy. How adequate is the design for addressing the issues posed in the evaluation? The emphasis is on the completeness of the design, the expected precision of the answers, the thought given to the limitations of the design, and the implications for the analysis of the data. The evaluator should know what work was undertaken previously in the area being evaluated. A careful review of previous reports or other pertinent documentation helps to avoid

duplication of existing work. The design should clearly state what evaluation questions determined the selection of the design. The evaluator must state the limitations of the study. How conclusive is the study likely to be? How detailed are the data collection and data analysis plans? What trade-offs were made in developing these plans?

o Feasibility. How feasible is the execution of the design within the required time and proposed resources? Adequate and appropriate designs may not be feasible if they ignore time and cost.

o Utility. How appropriate is the design with regard to the need for information, conclusiveness, and timeliness? What kind of information is needed? When should it be delivered? Being able to determine how well the design responds to these needs requires that the evaluator and the customer be in continuous consultation.

o Communication. How adequate were the discussions with the customer regarding information needs and the evaluation design? If agreement is not reached or is misunderstood, satisfaction with the final product is likely to be low. Because of these factors, the resulting report may not be used by the customer.

11. Test the Design. A well designed evaluation should be tested. Testing at one or more sites allows the evaluator to confirm the availability of data, their form, and the data gathering methods. The evaluator should select a site where the test represents an average case. If it is not possible to perform a test, the evaluator should verify the design's questions and assumptions; for example, regarding resources, by discussing these issues with peers. A formal peer review is a good quality assurance step.

12. Prospectus. The evaluation team should prepare a prospectus (also known as a charter or contract) to document the agreement between the evaluation team and its customer regarding the evaluation scope, commitment of resources, and milestones for conducting and completing the evaluation. Managers requesting or directly affected by the evaluation should be given an opportunity to review the prospectus and be briefed on its content. A suggested format for a prospectus is provided in Appendix B.

The probability of a smooth evaluation and acceptance of results increases when management agrees with or "buys into" the evaluation prospectus. The format for the prospectus can vary but should generally consist of one or two pages. It is suggested that the prospectus include the following information:

o Background. This section describes why the evaluation is being conducted and what issues led to the choice of the evaluation design.

o Purpose. The purpose includes a summary of the evaluation objectives. They should be based on a specific agreement with the customer and the judgment of the team as to what is appropriate for the situation.

o Scope. The scope identifies the boundaries for the evaluation, including the timeframe, organizational units to be included, the resources available for the project, and areas to be covered. It defines the data requirements by stating what information will be needed and where it will be collected.

o Methodology. The methodology is the approach the evaluation team will use to meet the evaluation objectives. It includes the evaluation design and data collection methodology. It answers the question of how the data will be gathered and analyzed.

o Staff Responsibilities. There will be various roles and functions of the members of the evaluation team, which may include both government personnel and any nongovernment consultants working on the evaluation.

o Schedule. The schedule is a list of evaluation tasks and the timeframe in which to complete them. It should take into account travel, holidays, and leave. The evaluation team should estimate the amount of time needed to complete each task and the date each milestone can be reached.

o Estimated Cost. The estimated cost encompasses the personnel and time requirements for completing the evaluation. It must take into account travel and any other costs specifically associated with the evaluation, including equipment, training, leased facilities, etc.

Section 4. Developing a Methodology

1. General. A methodology is a regular, ordered, and logical procedure for collecting and analyzing the data needed to answer the questions posed in an evaluation. In developing an effective methodology, certain issues must be considered:

o The Nature of the Review. Understanding the nature of the review ensures that the methodology will be focused correctly. Some questions to be addressed are: What is the overall purpose of the evaluation? Why is it being performed? How broad is the scope; for example, will conclusions be drawn about local or national issues, in one office or many? Are the findings and recommendations applicable to all sites, etc.?

o Validity and Reliability. The methodology must produce valid and reliable data. A valid answer is one that accurately measures what it is intended to measure. When the stated cause of an effect is accurate and all other alternative answers are ruled out, the answer has internal validity. External validity means the findings will permit inferences to a population beyond the specific cases that were examined. Reliability is a quality measure that suggests that the same results could be obtained each time in repeated observations of the same phenomenon.

o The Investment of Time in Methodology Development. Investing time in the methodology at the start saves time and money in the end. A poorly planned methodology yields invalid and unreliable data. A well thought-out methodology questions the "obvious" answer by making it a hypothesis to be proven instead of assuming it to be true.

2. Steps. Developing an effective methodology includes three steps in an iterative process; that is, each previous decision is revisited as part of each new step. These steps are:

- Determine data needs,
- Develop a sampling plan, and
- Develop a data analysis plan.

3. Factors Affecting Data Needs. Before deciding what data should be collected, a number of basic questions about the evaluation need to be answered. The type of evaluation and its scope will influence the kinds of data that will be needed. Some of the factors that affect data needs are:

o The Need to Generalize. This affects the scope of data needed. Every evaluation must have a clear rationale for deciding how many locations to observe, who to include in an opinion survey, or what data to extract from an information system, etc.

o The Need for Quantitative Versus Qualitative Judgments. This need is summarized in the choice between using the question "how many?" or "why?"

o The Degree of Certainty Required. The degree of certainty required can expand or contract the amount of data needed. For example, a question asked about a controversial subject may require a more comprehensive and objective approach than a question about a subject on which there is little divergence of opinion. It is important to consider at the outset whether or not there will be extensive opposition to any change recommended. The need to overcome doubts and hostility may make it advisable to include steps specifically directed at those issues in the project plan.

o The Credibility of the Data. The data should meet the basic tests of sufficiency, relevance, and competence. Sufficiency is the presence of enough factual evidence to support the evaluator's findings and recommendations. Information used to prove or disprove an issue is relevant if it has a logical, sensible relationship to that issue. Data should be valid and reliable. The following assumptions are useful in judging the competence of data:

-- Data obtained from an independent source offers objectivity; data obtained from more than one source offers more reliability than data obtained from a single source.

-- Data obtained through physical examination, observation, computation, and inspection are more reliable than data obtained indirectly.

-- Generally, information obtained from documents, recorded observations, and analysis of recorded information are more reliable than information obtained exclusively from interviews.

-- While collecting hard data is important, there is considerable value to being aware of the soft data that presents itself during an evaluation. For example, if a large amount of employees in an organization "feel" a certain way despite contradicting hard data, this finding should be taken into consideration by the evaluation team.

4. Data Decisions. Data needs are also a function of the performance measurements and standards the evaluation must include. To draw conclusions about effectiveness and efficiency, evaluators must decide what to measure, how to measure it, and what criteria will be used for drawing a conclusion. Decisions about these issues are particularly difficult if a performance measurement system does not exist or is questionable.

5. Relevant Attributes. Almost anything can be measured, but only certain activities or attributes will be relevant to the evaluation questions to be answered. Once the relevant attribute is identified, the measurement methods will depend on the questions to be answered. For example, measures of process efficiency can answer questions about "how much" or "when," depending on what unit and frequency of measure is used. For example, dollars per document or hours per document versus dollars per transaction or hours per transaction.

6. Standards for Comparison. For an evaluation team to draw conclusions based on measurements, the team must compare the results of its analysis with the criteria or standards of reference. Sources of the standards for comparisons include:

- Industrial or professional standards,
- Governmental regulations and related laws,
- Internal directives,
- Benchmarking against similar organizations or programs, and

o Historical performance.

7. Published Standards. The strongest of these sources of criteria are formal, externally published standards. Whether stated as absolutes or a specified range of tolerance, this type of standard is not only objective but also highly credible because it is based on rigorous analysis and tested by extensive experience.

8. Other Standards. Similarly, regulations, laws, and internal directives are useful as criteria, but sometimes these standards lack the analytical support and experience based on external standards. However, they represent strong authority for criteria. Often evaluation criteria must be developed as part of the study. To a limited degree, standards can be asserted, particularly for "good management principles" that the affected managers recognize as acceptable.

9. Benchmarking. Comparisons of similar organizations or programs are useful as long as the standard of comparison is specific and the managers of the entities being compared agree that they are similar enough for the standard to be reliable.

10. Historical Data. Historical performance provides criteria only if it is clearly relevant to the present. Changes in procedures, key personnel, policies, and organizational relationships can complicate the use of historical data for criteria.

11. Sampling. Regardless of the measurement methods and standards to be used, decisions about how much and what data to collect are essential to an effective methodology. When the universe of population of data sources is small, generally, less than 100, all of the population must be included to support strong conclusions. When this population is large, however, a statistical sample can be used. A statistician can help determine the sample size necessary. Be prepared to explain the size and key characteristics of the population so that the statistician can design a good sample framework. Data collected from a randomly selected and representative sample of a large population can be the basis for strong and convincing conclusions. Some sampling techniques for obtaining data about a representative part of a large population include:

o Simple Random Sampling. This is a method of choosing a sample in which each item in the population has an equal chance of being included in the sample.

o Systematic Random Sampling. This is a type of probability sample in which every unit in a list is selected for inclusion in the sample.

o Stratified Random Sampling. This is a grouping of the population into homogenous groups (or strata) before sampling. This procedure, which may be used in conjunction with simple random, systematic, or cluster sampling, improves the representativeness of the sample.

o Cluster Sampling. This is a method of obtaining a random sample of items of individuals that are grouped together geographically. Cluster sampling is often used when a random sample would be costly to use because of transportation and travel costs.

o Judgment Sampling. This is based on a rationale about how many and which of a number of items will be examined. It can be used when the objective of the evaluation will not require generalizing about the entire universe of items or activities. Common judgment sampling rationales include best case/worst case analyses and large/medium/small representative analyses. Other factors to be used for a judgment sample might be geographic representation or a similar characteristic intrinsic to the population to be evaluated.

12. Sampling Techniques. Some data needs can be met by collecting data from limited sources that are not mathematically representative of the entire population. This type of data can provide depth and color to detailed quantitative approaches. Sampling techniques include:

o Extreme or Deviant Case Sampling. This approach focuses on cases that are rich in information because they are unusual or special in some way. The logic of extreme case sampling is that lessons may be learned about unusual conditions or extreme outcomes that are relevant to improving more typical programs.

o Maximum Variation Sampling. For small samples, a great deal of heterogeneity can be a problem because individual cases are so different from each other. The maximum variation sampling strategy turns an apparent weakness into a strength by assuming that any common patterns that emerge from great variation are of particular interest and value in capturing the core experiences and central impacts of a program.

o Homogeneous Samples. This strategy involves picking a small homogeneous sample to describe indepth a particular subgroup. A program having a variety of customers, for example, may need indepth information about a particular subgroup.

o Critical Case Sampling. Critical cases are those that can make a point dramatically or are particularly important. A clue to the existence of a critical case is a statement to the effect that "if it happens there, it will happen anywhere," or "if that group is having problems, then we can be sure all the groups are having problems." Looking for the critical case is particularly important where resources limit the evaluation to the study of a single site. Under such conditions, it makes sense to choose the site that would yield the most information about other sites.

o Criterion Sampling. In this type of sampling the evaluator reviews all cases meeting some predetermined criterion of importance. This approach is used commonly in quality assurance efforts; for example, all cases involving collision avoidance reports or all procurements of over $1 million.

Section 5. Collecting Data

1. General. Collecting data is generally the most time-consuming and expensive part of an evaluation. It is also the critical step that paves the way for drawing convincing, well-supported conclusions. For this reason, data takes the emotions out of decisionmaking. Beginning with a reiteration of the evaluation objectives, the evaluation project manager or team leader must decide:

- What the data needs are,
- What the sources of the data are, and
- How to collect the data.

2. Data Needs. When it is difficult to establish data needs, the objectives are probably too ambiguous or poorly defined. A question that sounds very concrete and interesting can be a very difficult one to answer. At this point, such design criteria as report deadlines or resource constraints must guide decisions. Revising the objectives can be the best road to success.

3. Data Sources. Given data needs, the evaluation team must determine its availability and how to collect it. The most useful sources include:

- Computer Systems. Extracting data from existing information systems or databases has several advantages. It can be fast if all that is required is transferring the data from one system to another and incompatibility is not an issue. It can also reduce costs since some of such expensive steps, such as gathering, examining, formatting, and entering data into a computerized system, are eliminated. However, computerized extraction can be problematic in that the data were originally gathered for purposes unrelated to the evaluation and may be cumbersome to locate, transfer, and manipulate. In addition, it is sometimes necessary to confirm the timeframe, accuracy and reliability of such data.

o Published Documents. Information on any subject exists in documents published by FAA, other Government agencies, private individuals, and organizations. Some information; for example, legal or regulatory requirements, must be acquired from documents. Other types of information; for example, managers' descriptions of the steps in a process, can be confirmed in guidance documents. If a judgment about the documents themselves is an objective of an evaluation, formally establishing the criteria to be applied and training team members to ensure consistent application are essential planning steps. Some examples of internal FAA publications from which data can be extracted include the Guide to Federal Aviation Administration Publications, Directives Checklist and Orders, Budget Estimates, Administrator's Fact Book, FAA Strategic Plan, FAA Business Plan, and the Annual Procurement Plan.

o Records and Files. These data are usually maintained in individual offices and often contain unique information that would be difficult or impossible to obtain from other sources. The information is generally unbiased because it was recorded for purposes other than evaluation. It may not be accurate, however, and it will probably be dispersed, making the review time-consuming and travel-intensive. It is essential to ensure that criteria are appropriate and consistently applied when collecting data from records and files.

o Observations and Tests. Systematic recording of observations, as well as tests or demonstrations of how a procedure works (or does not work), can provide valuable information for "how" or "how effective" questions. Observations are generally made visually; for example, listening to tape recordings of radio communications. Similarly, such a test as calling a hotline number to measure response time or accuracy of response can provide information that is both convincing and unique. To be useful, observations must be performed consistently and recorded systematically. One or two calls without a record of where or when and what questions were asked is inadequate.

o Surveys. Some evaluation questions require an assessment of opinions or attitudes among a large or geographically dispersed population. A survey to be mailed or administered in interviews is useful for gathering this

type of information, and it requires careful planning and preparation to ensure that the data collected are accurate and reliable. The uniformity of the data provided can make analysis much easier and conclusions more convincing than is possible with less structured opinion-gathering approaches. When a survey or questionnaire are used in a union environment, prior coordination with the union is mandatory.

4. Collection Methods. Data is collected using various instruments, which are checklists or worksheets that have been carefully developed as aids to the persons collecting the data. A good instrument lays out what the data are, where they are to be collected, and how they are to be recorded and organized. It is important to standardize these instruments to ensure that the team collects all data consistently and completely and to facilitate the subsequent analysis of the data. A carefully developed format allows efficient and systematic collection of uniform information. The instrument can be filled out by the evaluator or it can be filled out by the people who are the source of the information. Some examples of these instruments are:

o Questionnaires. This method of collecting data is cost-effective when interacting with a large number of people. Careful planning and administration are important. Time is required to develop the questionnaire, pretest it, mail it or train interviewers, perform followups to ensure an adequate response rate, and maintain quality control. Pretesting is the process of administering the questionnaire to representatives of the group to be surveyed for the purpose of refining the questionnaire; for example, checking that the questions are not ambiguous or open to misinterpretation and that the time required to complete the questionnaire is reasonable. The following elements should be present in a questionnaire:

-- Questions should be asked in a format appropriate to the purpose and data needs of the evaluation. Questions be open-ended; that is, have no anticipated responses, or they can have limited, specified choices or rating scales. While open-ended questions are obviously more difficult to aggregate or quantify, they can provide broader, more probing answers. Each question should be free of ambiguity, easily answered by everyone in the sample, and ordered to increase the response rate. Pretesting the questionnaire is a good quality check.

-- Questions should be relevant and proper. The pretest helps eliminate any questions that cannot be clearly related to the evaluation's objectives or that may be perceived as objectionable, sensitive, or threatening. Questions should be asked in a format and sequence that will avoid bias in the responses; for example, avoid emotion-laden words or manipulative sequencing. Good instructions, uncomplicated sequencing, and subtitles and transitional phrases should also be included.

-- A comprehensive list of relevant, mutually exclusive responses should be provided. All important categories of responses that respondents may want to provide and that will be understandable to respondents should be included. Responses should be quantified, where possible, and quantified responses should be realistic and meaningful; for example, the percentage of time spent on tasks or numbers of requests for particular services.

-- The data collection effort should be planned ahead of time. A data analysis plan identifying how the information obtained will be used and which questions will be linked to provide answers to broader questions should be developed. In addition, mailing lists, addressed envelopes, followup procedures to ensure an adequate response rate, and administrative procedures for receiving, aggregating, and analyzing responses should be prepared before the first questionnaire is administered.

o Face-to-Face and Telephone Surveys. Time should be allowed to train interviewers for face-to-face and telephone delivery. The advantages of surveys can be lost if they are poorly administered. Observations of reactions to different questions, explanations of complex background material, and minimizing followup needs require trained interviewers. Therefore, the following suggestions are offered:

-- Ask the questions exactly as worded in the questionnaire,

-- Ask the questions in the order presented in the questionnaire,

-- Read each question slowly,

-- Repeat questions that are misunderstood or misinterpreted,

-- Do not let the respondent stray from the questions,

-- Keep nonverbal cues as neutral as possible,

-- Use probing techniques to stimulate a response; for example, repeat the question, use an expectant pause, repeat the respondent's reply, or use neutral questions or comments.

-- Use reinforcements; for example, "I see," "I want to make sure I have that right," "It is useful to get your ideas on this," It's important to get your opinion," and "I see, that is helpful to know."

-- Read back the notes you have taken to ensure that the information is complete and correct.

o Mail Surveys. Administration of a mail questionnaire includes preparing a cover letter explaining the importance and intended use of the results, as well as how to complete the questionnaire. If confidentiality is an issue, let the respondents know that their identity will be protected, and then ensure that your promise is kept. The transmittal letter should also set a deadline for returning the questionnaire and include a stamped envelope with a return address. For very critical questionnaires, a second mailing or a followup letter may also be necessary.

Section 6. Analyzing Data

General. Each evaluation is unique. Evaluation teams, therefore, need to tailor their analysis to each situation. Using certain procedures will facilitate good data analysis. The following steps are suggested for use in analyzing data. They are:

o Conduct Analysis During Data Collection. Data needs to be analyzed when the data is collected to determine the data's reliability. As the team members collect the data, they must assess the accuracy, relevance, and value of each item of information. This review may involve cross-checking information between reports, verifying numbers between information sources, and appraise the plausibility and consistency of interviews and discussions. Data collectors perceive meaning in information as they collect it. These early impressions should not bias the overall analysis but can be recorded for future consideration. For example, interviewers can make observations as they gather information and capture that information in a special section. Team members should be encouraged to fill out this section immediately after each interview. These comments can include perceived patterns of information, points to check, new categories to create, and tentative conclusions. They can also include observations about behavior or the conditions at a site. Another suggestion would be for team members to write informal analytic memos throughout the course of the evaluation. These memos can be a vehicle for the team to brainstorm about the data collection process. They should be circulated to all those involved in the evaluation. If time constraints preclude the use of these memos, the team leader should contact team members after each series of interviews or site visits to discuss their impressions.

o Debriefing. Debriefing data collectors serves as a rough-cut analysis. It allows the team members to discuss perceived findings, outline tentative conclusions, and sketch some possible recommendations. Effective debriefing sessions require that all team members be included. This reduces the risk that all analysts will share the same biases and oversights. A free exchange of opinions and information is also important. As with the analytic memos discussed earlier, the debriefing should be uncensored and

encourage disagreement as well as agreement among team members.

o Raw Data Set. Before beginning the analysis, the raw data must be aggregated and edited. Regardless of how carefully data has been gathered, gaps of information will exist. The evaluation team should attempt to recover missing data by returning to records and contacting respondents and interviewees. If some data cannot be recovered, the evaluator should note this and explain the problem. Once the raw data is complete, it must be edited to remove illogical or irrelevant information. The evaluator can prepare an editing guide that identifies illogical answers to survey questions or unlikely observations.

o Preliminary Findings and Conclusions. Recording preliminary findings is useful for the evaluation team and acts as a progress report on the project. These findings are a part of the ongoing analysis and not a final product. Evaluation team members can use a variety of displays to present these tentative findings, including checklists of important factors, organizational charts, flowcharts of processes or procedures, decision trees, and historical timelines. Data are compared with the standards that were established in the data analysis plan as acceptable levels of performance. The final task is to interpret and verify the preliminary findings. The evaluation team must decide what the implications of their findings are for the program being evaluated. Interpreting the findings can be the most difficult part of the analysis. The team members must determine if the findings present a pattern, a strength or a weakness, an inefficiency, or an emerging problem. Their insight is the key to this effort, and a creative insight can be the difference between a routine evaluation report and one that makes a real contribution to the program.

o Data Analysis Techniques. Data analysis refers to the analysis of all the information the evaluator has collected, including not only numerical data but also opinions, observations, literature reviews, previous reports, records of performance, and other measures. When the database has been completed and edited, analysis can begin.

-- Analysis should begin with the examination of a single variable or item. This can include analyzing answers from a written survey, topics from a discussion guide, or information from an existing database. This type of analysis of quantitative information usually produces descriptive findings, such as measures of central tendency (mean, median, or mode), the minimum, maximum, and range of the responses, and their variance and standard deviation. When analyzing qualitative information, single item analyses produce descriptive findings, such as the typical response, the diversity of responses, and unusual responses.

-- Although analyses of single items or variables are helpful in describing each variable, only analyses of more than one variable can determine the relationships between and among variables. For example, single variable analyses can reveal how many general aviation accidents occurred in a given year and how many pilots had instrument ratings. However, multiple items must be analyzed to determine whether instrument-rated pilots had a lower accident rate than non-instrument-rated pilots. Quantitative data can be easy to summarize and useful to measure change over time; however, it may also oversimplify complex relationships.

-- Analysis of qualitative data requires synthesizing data to identify patterns. Qualitative analysis can typically yield information concerning program implementation and execution; major program processes; roles and relationships; observed changes, outcomes, and impacts; and program strengths and weaknesses. Data generated by qualitative methods may be voluminous and much of the analytical work involves organizing the data, for which there are no standard formulas as in quantitative approaches. The team should be open-minded, looking for patterns in the information. The steps involved include organizing and classifying recurring comments and findings into topics, descriptive units, categories, patterns or themes; attaching significance to these by probing for relationships and linkages; and examining common elements across program or organizational entities, such as quality of service, quantity produced, timeliness, effectiveness, and efficiency.

o Use of Statistics. One definition of statistics is "an area of mathematics seeking to make order out of collections of diverse facts or data." Statistical techniques have been developed to help in the investigation of events in which there is a strong element of probability rather than a completely determined outcome. The two basic types of statistics are discussed below:

-- Descriptive Statistics. This type is used to summarize and interpret otherwise confusing sets of data. For example, if a large set of scores on an examination has been collected, descriptive statistics can be used to summarize the scores. Data can be characterized in three ways as described below:

- Frequency Distribution. This is the graphical or tabular portrayal of a single variable that shows the number of observations from the data set that fall into each of a set of mutually exclusive classes. It can provide a clear indication of the range of the numerical data, the frequency with which a particular numerical value appears, and a rough indication of the average for the data set.

- Measures of Central Tendency. There are three measures of central tendency as follows: the mode, which is the value occurring most frequently in a set of data; the median, which is the 50th percentile (that is the value below which 50 percent of the values in a sample fall); and the mean, which is the simple arithmetic average.

- Measures of Dispersion. There are three measures of dispersion as follows: the range, which is the difference between the smallest and the largest number in a set; the standard deviation, which is the measure of how values are spread around the center of a distribution; and the variance, which is the square of the standard deviation, which describes how the data are dispersed.

-- Inferential Statistics. These statistics are used to decipher patterns in data from large populations. Data collected from an appropriate sample enables analysts to draw conclusions about entire populations or groups within a population. Techniques, such as hypothesis testing, sensitivity analysis, correlation, co-variance, and regression analysis can be used to describe relationships

among variables. These methods indicate the degree to which changes on one variable correspond to changes in another. This does not necessarily establish that one variable caused changes in the other, but used in conjunction with carefully formulated questions and research strategies, these techniques can establish cause and effect relationships.

o Models. Models are representations of complex relationships that are used to describe a situation or an environment. Once a model is constructed, the effects of changes in the assumptions used to construct the model can be observed. Models may be highly mathematical and focus on output or qualitative and focus on process. A flowchart is a good example of a simple, useful model. It uses geometric shapes to represent steps in a process, organized in the sequence of occurrence. With the addition of time or financial resources consumed in each step, predictions can be made.

Section 7. Writing the Report

1. Goals. Communicating the results of an evaluation to program managers and decisionmakers is key to its success. Before beginning on a final report, the evaluation team should remember that their jobs as consultants are to provide the customer with a summary of the findings and the team's recommendations for improvements, and to document the historical record of the study. To achieve these goals, the evaluation team should:

- o Determine if there are additional personnel, in addition to the customer, who may be impacted by the evaluation report;

- o Conduct a meeting or teleconference to develop a consensus among the evaluation team members, develop effective recommendations, and plan the preparation of the evaluation report;

- o Write an effective evaluation report; and

- o Design, prepare, and present effective briefings.

2. Audience Analysis. The customers for an evaluation report should have been identified in the design phase but should be reconsidered before the report is written. Any changes in policy, personnel, or organization that have taken place since the evaluation began need to be acknowledged in the report and by the report writers. Will the report be readily accepted by decisionmakers? Are technical or programmatic details more critical for acceptance? Other personnel, in addition to the customer, may be impacted by the evaluation report. The perspective of the audience should be considered.

3. Achieving Consensus. The process of communicating evaluation results begins with determining the report's central message. As with any consensus, this resolution results from discussion among team members, which can occur at a meeting or teleconference. This type of gathering results in recommendations and a report framework, as well as writing and editing assignments. In addition, this gathering will help to ensure that the report is:

o Comprehensive. The evaluation team must step back from the detailed analysis to get an overview of the evaluation. This gathering of the team should reacquaint the members with the original purpose of the evaluation and pool all the data collected to address the objectives.

o Balanced. The opinions of team members should be addressed in terms of the conclusiveness of the data analysis. Team members must have confidence in the quality of the evaluation because they will be the primary salespeople of the evaluation's findings and advocates for the implementation of the recommendations.

o Coherent. The customer needs to hear one clear message articulated by one voice from the evaluation team rather than several voices and viewpoints.

4. Recommendations. The implementation of evaluation recommendations depends partly on how the evaluation team presents the recommendations to the customer. It is helpful to present the recommendations in a positive manner. If a member of the organization has been actively involved as an evaluation team member, the organization is more likely to buy-in to the resultant findings and recommendations. The evaluator must balance the needs of the organization and the needs of the customer when formulating recommendations to improve the program or process.

5. Developing Recommendations. Devote time to recommendations throughout your evaluation. For example, begin recording possible recommendations as soon as you start collecting data and forming impressions. Continue recording these possibilities as the evaluation progresses. The following suggestions are offered:

o Look for ideas in a wide variety of sources. For example, earlier studies of similar programs may suggest recommendations relevant to your current situation. Involve program staff members at all levels because differing perspectives often produce good ideas.

o Work closely with program personnel throughout the process. Evaluators should work openly and honestly with all stakeholders every step of the way, in order not to surprise those involved. Ask for their views on how to make

improvements in the program areas. Use them as a sounding board for the evaluation team's ideas. As you begin to focus on possible recommendations, work to build acceptance for them.

o Consider the context into which your recommendations fit. They must make sense within the program's organizational context.

6. Presenting Recommendations. You may want to first present those recommendations that have the most likelihood of being implemented immediately, followed by those that might be carried out at a later date. If a recommendation is unlikely to be adopted but essential to the integrity of the evaluation, recognize that probability. Briefly discuss the nature of the opposition and rebut those arguments. Discuss the pro's and con's of alternatives considered. The following suggestions are offered:

o Generally avoid recommending broad fundamental changes; for example, suggesting the restructuring of a program's basic objectives or approach may not be advisable because basic changes threaten the organization's status quo. If possible, reach your objectives through incremental improvements within an organization's existing framework.

o Show the future implications of your recommendations. Illustrate in detail the specific benefits expected from each recommendation and the types and amounts of resources necessary. Consider planning an implementation strategy in advance as an integral part of each recommendation. Besides helping to sell your recommendations, such a plan can speed up implementation.

o Make recommendations easy for decisionmakers to understand. Avoid a long, undifferentiated list of recommendations. Categorize recommendations in meaningful ways, such as "short-term versus long-term," "inexpensive versus expensive," or "major versus minor."

o Place the recommendations strategically within the text for effectiveness. Recommendations may be clearer if placed immediately after the relevant findings or they may be better placed at the front or back of the report.

o Test the clarity of the report to ensure that it conveys your message. Carefully evaluate suggested editorial revisions to preserve the meaning of the text being changed.

7. Effective Formats. The actual composition of the evaluation report requires the use of an outline or guide, an understanding of good writing style, and a method of reviewing the report. It is suggested that every evaluation report contain the following paragraphs:

o Executive Summary. This summary should provide the reader with an overview of the program evaluated, the way the study was carried out, and the major findings and recommendations. The executive summary should not contain introductory material about the report. It should be kept as brief as possible, preferably no more than two pages in length.

o Introduction. Provide the reader with a brief explanation of the specific questions addressed by the evaluation. Briefly acquaint the reader with details of what he or she is about to read. Identify the program being evaluated and the program, function, or activity reviewed; provide details about when the study was conducted and by whom; and refer the reader to related studies. Within the introduction the following sections are suggested:

-- Background. Outline the history of the program and the legal or regulatory mandate giving the authority for the organization or program.

-- Objectives. Describe the key questions the evaluation was designed to address.

-- Scope. Provide a general description that explains where and when the team conducted the evaluation. Describe the procedures and the amount of activity that was studied.

-- Methodology. If the methodology--or approach--used in the study is complex, this information may require a separate chapter or appendix. Otherwise, the methodology can be described in the introduction of the report. Avoid technical jargon when explaining the methodology and explain

any statistical tests used in the study so that an intelligent layperson can understand them and how they are appropriate to the evaluation. Include a discussion of the limitations of the methodology used in the study.

o Findings and Recommendations. Explain the evaluation findings in chapters or sections with headings. Present the findings as clear statements supported by analysis. An inductive logic with the generalization presented first--followed by the details--is easier to read than the reverse, deductive logic. The recommendations can follow each conclusion or they can be placed in a separate section of the chapter. In either case, make clear to the reader how the recommendations are supported by the findings drawn from the data analysis. Evaluation is a form of management feedback. Therefore, emphasize any positive findings made during the evaluation. Present any negative findings in the most positive way possible; for example, as "opportunities for improvements."

o Appendices. The appendices should contain information that is too technical or lengthy for the body of the report. The appendices should contain documentation that supports the report's findings. Examples of appendices include detailed statistics and calculations, a list of interviewees, an interview guide or questionnaire summary, a glossary, or a list of acronyms.

8. Report Characteristics. Attention to style, as well as content, will ensure an effective report. The following characteristics are suggested:

o Professional Tone. Tone is revealed in the language used. A professional tone is conveyed in common, easily understood wording and simple, straightforward reasoning. Avoid emotional or angry language as it detracts from objectivity and impairs the effectiveness of the report.

o Clarity. A report must be clear to busy managers and decisionmakers who have a general knowledge of the program but not detailed technical knowledge. They should be able to understand the report by reading it once. Acronyms should be spelled out the first time they appear in the report. Avoid using jargon; that is, technical language not

generally understood outside a specific profession. Where using jargon is unavoidable, define the term with simple words when first using it in the report.

o Conciseness. Limiting the number of words helps to focus reports on key points. Short, carefully constructed paragraphs carry readers rapidly from one idea to the next. Frequent space breaks between paragraphs rest the eye and help the reader absorb one complete thought before starting the next. Paragraphs over a third of a page should usually be avoided. Generally, the shorter the report is, the better. Everyone is put off by a lengthy report--anything over 30 pages in considered lengthy.

o Accuracy. A report that contains misspellings, typographical errors, mathematical errors, or mistakes in dates or names loses its credibility, regardless of its technical or managerial value. Spell-checking is easy with a computer, but it must be accompanied by proofreading to catch the errors in grammar, usage, and style.

o Graphics. Captions, graphs, and charts are useful for letting readers see complicated data at a glance. These graphics should supplement the narrative, not replace it. You should explain the point made in the graphics in the text because some people do not read quantitative displays.

9. Report Review. Good reports are usually not written; they are rewritten. Every report, therefore, should go through a series of drafts. The first drafts may be reviewed by a limited number of people for major comments or content, organization, and style. As the report is further refined, it should be thoroughly reviewed for technical details, grammar, punctuation, and word choice. Carefully proofread the report before releasing it outside the office. Every report should be submitted for comment to the managers affected by its recommendations.

10. Effective Briefings. A briefing is an opportunity to sell key report findings and recommendations. Briefings held at regular intervals allow for feedback from program managers and decisionmakers, preventing the evaluation from going off in the wrong direction. How often these interim briefings are held depends on the scope of the evaluation

and the need for feedback. If several briefings are held, the final briefing should incorporate input from those sessions and focus on the evaluation's findings and recommendations. The final briefing should generate momentum for action. A briefing should create a forum for discussion. It should also successfully convey findings and recommendations and provide an opportunity for questions.

o Entrance and Exit Briefings. At a minimum, entrance and exit briefings should be given to the customer and other managers affected by the evaluation. In addition to fostering open communication and eliciting support, the entrance briefing is a courtesy to the people who will be providing information and spending time with the evaluation team. After the evaluation is completed, the exit briefing allows the evaluation team to summarize their efforts. It also keeps the affected managers informed about what may happen next and allows them to feel involved. Either before or immediately after the report is published, it is a good idea to brief decisionmakers who can act on recommendations. The purpose is to get endorsement and direction for implementing recommendations. Requests for decisions should be clearly stated as such, and a record of decisions made should be transmitted to the affected managers.

o Briefing Materials. Preparing the briefing material includes determining the appropriate visual aids for the audience. The evaluator should learn whether the audience prefers overhead transparencies, projected slides, or on-screen projections of computer presentation software packages. A handout, usually an exact duplicate of the briefing charts with additional information, if necessary, should be prepared for each audience member. A handout facilitates notetaking or jotting down questions and provides a record of the briefing.

o Setting the Stage. The three major phases of the briefing are:

-- Framework. Give an introduction stating the purpose and importance of the evaluation, the names of other presenters, and the nature of the discussion to follow.

-- Body. Summarize the background, findings, and recommendations of the evaluation. This phase should take no more than one-third of the time scheduled for the entire briefing.

-- Discussion. The remaining time should be used to receive comments and answer questions from the audience. Be sure to encourage active audience participation.

o Presentation. For a presentation to be effective, briefers should accomplish the following goals: immediately capture the attention of the audience, make the presentation understandable, interact with the audience as much as possible, bring the findings "to life" by adding examples or anecdotes to give findings more personal interest, present a completely professional image, and help generate the momentum for further action.

11. Sensitivity of Reports. The evaluation report is prepared by the team for its customer. However, there may be instances when the customer desires to share the report with agency personnel outside his or her organization. It is suggested that, in these instances, the customer make any additional copies and distribute the report according to his or her preferences. To ensure the sensitivity of an evaluation report, the evaluation team may stamp or otherwise mark the report "For Official Use Only." However, please note that under the Freedom of Information Act (FOIA), individuals may be able to obtain copies of evaluation reports or other data that otherwise would not be made available to them. Please contact the FOIA Staff (AAD-40) for more guidance as needed.

12. Paperwork Reduction Act. Under this Act, the agency cannot survey or collect data from more than nine non-Federal individuals without first obtaining clearance from the Office of Management and Budget. However, in most cases, the data collected during an evaluation would originate within the agency. Therefore, this Act should not normally impact agency evaluations. Please contact FAA's Public Reports Officer (ABC-100) for additional guidance as needed.

Section 8. Evaluation Followup

1. General. One of the primary goals of evaluations is to produce change by improving the efficiency and effectiveness of a program, function, or activity. Followup, tracking, and trend analysis are vital steps in achieving this goal. Planning for continuous followup facilitates the entire evaluation process.

2. Followup Systems.

o Order 1800.2G requires that Assistant and Associate Administrators and Heads of Offices, Services, Regions, and Centers ensure that a system for planning, conducting, and following up on evaluations, appraisals, and studies exists within their areas of responsibility. While it should be the primary responsibility of the customer to monitor his or her organization's progress in implementing improvements, the evaluation team itself may conduct followup activities if requested.

o Some FAA organizations make onsite visits to obtain followup information; others do it during another evaluation.

3. Status of Recommendations. Determining when a recommendation is completed is more than just checking off a list of requirements. Although specific recommendations are made as part of the evaluation report, flexibility is required when defining compliance with those recommendations. The most important factor in implementing recommendations is that the intent of the recommendation be met. For example, a program manager may know of a way to resolve a problem that is different from the method suggested in the evaluation report. It is not necessary to insist on a particular means of solving a problem, only that the problem be addressed. Sound judgment and a mutual commitment to the evaluation's goals are the keys to this step in the evaluation process.

4. Trend Analysis. As part of every evaluation, the evaluator should examine the data to identify patterns in performance and changes in patterns over time. Such patterns may suggest the need for remedial action or may be evidence of a well managed program. Similarly, changes in

patterns may be evidence of an improvement or deterioration. Trend analysis is the measure and interpretation of these changes. The goal of trend analysis is to describe the change in performance over time and to determine if the findings recur from one evaluation to the next.

5. Measuring Systematic Problems. Before any changes in performance can be detected, a baseline must be established. Change can only be measured as the difference between two or more sets of data. In addition, trend analysis can be misleading if there are not enough data to describe a long-term pattern. Merely describing change from one evaluation period to another does not identify a trend. The change may be temporary and reflect unusual circumstances rather than a true difference. Trends are discerned by applying qualitative and quantitative analysis to program evaluation information, just as is done in individual evaluations.

6. Trend Analysis for Planning. The process of day-to-day management is often reactive; however, with longer term information available, a manager can plan productively and anticipate changes. By analyzing data tracked over time, the program manager knows where the program was, knows where it is now, and has a good idea of where it is going. The manager can observe the impact that certain changes have had and can identify unusual or uncontrollable occurrences that are short-term in nature and not likely to be repeated. In addition, trend analysis may reveal potential problems that were not recognized previously. The sooner a negative trend is detected, the quicker corrective actions can be planned and implemented. The results of a program's trend analysis may identify patterns that are applicable to other programs throughout the agency.

CHAPTER 4. APPRAISALS

1. General. Appraisals are another method of studying or evaluating management and organizational issues. They differ from other modes of analysis in that appraisals frequently cross organizational or programmatic lines and are usually requested by senior management for specific purposes.

2. Design. The individual, team leader, or team that will perform the appraisal will meet with the customer requesting the appraisal to determine the nature and scope of the appraisal. Upon obtaining that information, the appraisal will be designed. A design process similar to that used in evaluations and staff studies can be used, if appropriate (see chapters 3 and 5). The individual or team conducting the appraisal will prepare a prospectus, or charter, and present it to the customer for approval and signature.

3. Data Gathering and Analysis. Procedures used to gather and analyze data should be appropriate to the type and complexity of the appraisal. Methods available include those described for evaluations and staff studies or they can be tailored to meet specific needs of the customer.

4. Report Format. The method of reporting should be discussed with the customer and an agreement should be reached before beginning the appraisal. Reports can be presented in writing or orally, or both, and should be tailored to meet the specific needs of the customer. The recommended formats for evaluation and staff study reports (see chapters 3 and 5) can be adopted for appraisals as appropriate.

CHAPTER 5. STAFF STUDIES

Section 1. General

1. General. A staff study is one way to review and report on the status of an organization's programs, processes, or functions. The goal should be to give management an objective view of the situation or problem, options open to management, and recommendations for the best course of action. The presentation of findings and the study itself should be as brief and complete as possible. A comprehensive study should answer all the questions in a short, objective manner and recommend the best option to resolve or alleviate the problem.

2. Basic Elements. Regardless of the type of study or report format used, every study should cover five basic points:

o Defining the Problem. The study should identify the real problem, which may differ from the symptoms leading to the request for a study.

o Getting the Facts. Without accurate, verifiable facts directly related to the problem and its causes, the study cannot develop, support, and sell its recommendations.

o Stating the Cause of the Problem. Unless the study establishes the cause, the solutions may not keep the problem from recurring and may have no relevancy at all to the problem. However, it should be noted that studies may be conducted for other reasons; for example, data collection.

o Selecting Courses of Action. The study should offer viable courses of action and should objectively explore the advantages and disadvantages of each.

o Describing What Must Be Done. Once the study identifies the basis of the problem and its cause(s), the report clearly states what should be done to solve the problem by eliminating or controlling the causes.

3. Staff Study Format. Written study reports should contain only essential facts and arguments. If this can be done in a few paragraphs, only write a few paragraphs. If the study requires a formal, indepth report, please refer to section 5 of this chapter for a discussion of the recommended paragraphs to be included in a staff study. This standard format is a guide to ensure that the report covers the subject in an organized, logical manner. However, the reader should disregard those paragraphs that may not be relevant to an individual staff study. For example, if there are no relevant assumptions, do not invent them. It is important to give the reader the necessary facts to make an informed decision. Use persuasive facts, not arguments, and review all perspectives of the issue. The writer recommends decisions; the decisionmaker implements them. A sample staff study format is provided at Appendix D.

4. Other Report Formats.

o Use a modified format when it presents the results of a study more effectively. Feasibility studies for automated data systems and economic analyses for National Airspace System investments are examples of studies that may require modified formats. Clarity of presentation is the governing consideration. When possible, however, use the format suggested in this guide.

o Order 6011.4, Facilities & Equipment (F&E) Cost Estimating Procedures and Summaries handbook, prescribes standardized procedures for preparing F&E cost estimates for budgetary and/or reprogramming actions.

o Order AF 1800.2, Airway Facilities Service Life Cycle Cost Studies, provides guidelines for completing life cycle cost studies.

o There are also other specialized program activities within the agency that have limited study procedures.

Section 2. Planning a Staff Study

1. General. As with evaluations, good planning is necessary for a successful staff study. A careful, sound design increases the strength of the findings and recommendations.

2. Initial Orientation.

o Once a staff study has been requested, the project should be discussed to understand both the problem or circumstance and the needs of the customer. It is necessary to be familiar with the organizational structure, equipment, property, and program associated with the study. You should accumulate enough general knowledge during the orientation to develop a prospectus or a study plan before getting into specific details. If possible include potentially affected employees or their representatives in the orientation.

o Not all studies and surveys originate with a problem; some are fact-finding surveys. Others are initiated because management wishes to reassure itself that problems do not exist. This document focuses on the need for problem identification under the assumption that most studies originate because a problem does exist, as well as studies originating for other reasons.

o Do not mistake symptoms for problems. This can lead to improper use of personnel resources and inaccurate conclusions. Therefore, be absolutely certain that the problem is properly identified so that the problem is not left unresolved.

o If problem redefinition is required, advise the customer as soon as possible. Redefinition may change the study priority or lead to a change in the resources allocated to the project. Additionally, if the customer requires an immediate solution, a course of action other than a study may be preferable.

3. Prospectus. The final step in designing a staff study is to prepare the prospectus, also known as a charter, agreement, or contract). This document serves as a contract between the customer who requests the staff

study and the person, team, or organization conducting it. It should be signed, at a minimum, by the customer and the study team leader. The following elements should be included within a prospectus:

o Background. Describe why the staff study is being conducted and what issues led to the choice of the study design.

o Purpose. Include a summary of the study objectives, which should be based on a specific agreement with the customer. Consider the resources that are available and appropriate for the project.

o Scope. Describe the boundary for the study, including the timeframe, organizational units to be included, and areas to be covered. Define the data requirements by stating what information will be needed and where it will be collected.

o Methodology. Describe the approach used to meet the study objectives. This information includes the study design and the data collection methodology.

o Assumptions. If applicable, include anticipated actions or events as well as "no changes" taking place. Anticipated actions or events include approved planning documents. Assumptions are issues the study team, as well as concerned organizations, are likely to accept.

o Staff Responsibilities. Address the roles or skills required to perform the study, which includes both government personnel and nongovernment consultants working on the study.

o Estimated Cost. Address any anticipated costs; for example, any travel required to gather data.

o Schedule. Provide the schedule for the study, including the major steps in the process and the timeframes for completing them. Consider any possible travel, holidays, and leave. The following elements should be addressed:

-- Define the purpose statement and prepare the prospectus.

-- Develop and obtain an agreement on a plan of action and methodology.

-- Collect data and conduct interviews.

-- Analyze data and prepare preliminary recommendations.

-- Prepare the report.

4. Study Plan. The study plan lists the forecasted phases and milestones of the staff study with the estimated completion dates for each. The methodology that the staff specialist will use is also provided in the study plan. The following elements should be included within a plan:

o Approach. Provide the methodology that will be used in the study to achieve the study objectives.

o Completion Date. Include the study's estimated completion date.

o Techniques to Be Employed. Describe the techniques the study team will use to collect the data.

o Data to Be Collected. Describe the types of data the study team will gather.

o Resources Required to Conduct the Study. Provide the titles of the study team members, as well as the titles of outside consultants assisting in the effort.

o Outputs of the Study. Explain that the study team will provide the customer with recommendations for improving the efficiency and effectiveness of the program, activity, or organization being reviewed.

Section 3. Collecting Data

1. General. Collecting data is the most time-consuming and expensive part of a staff study. It is also the critical step that paves the way for drawing convincing, well-supported conclusions.

2. Identification of Information Required. Once the objectives of the study are determined, or a specific problem is identified, the study team determines what information is needed. This decision is impacted by the nature of data to be collected, data analysis procedures, project costs, methodology to be used, and the amount of disruption to agency operations.

3. Cost of Data Gathering. This can be a significant factor if a large number of people commit a significant amount of time to preparing data, the data collection process is extended over a long period of time, or if data analysis requires use of information resource systems. For these reasons, the study team should limit data collection to that directly related to the problem or issue being studied.

4. Methodology Used. The cost of collecting data, requirement for validation, its availability, and study time parameters will impact the methodology used to gather data. The most useful sources include:

o Questionnaires. Distribution of questionnaires to an appropriately identified audience is an easy way to efficiently collect data. A major advantage of questionnaires is the potentially wide coverage they offer at relatively little expense. In addition, some people may be willing to provide data anonymously in a questionnaire that they would not be willing to provide in an interview. However, questionnaires have several drawbacks, which include the questionnaire's structuring and the sequence in which questions appear. If not arranged properly, the questions can condition the responses. Recipients do not always interpret questions alike, which may bias the responses and perhaps make them completely misleading. Another disadvantage is that response rates can be lower than anticipated or lower than required for statistical significance. To obtain

an objective analysis of the effectiveness of a questionnaire, pre-test it with a selected group before distributing it to the intended audience. Coordination with union representatives is required prior to the distribution of questionnaires or surveys to employees in national bargaining units.

o Interviews. Unlike questionnaires, interviews allow interviewees to provide data that they may be reluctant to provide in writing. Interviews provide an opportunity to clarify the meaning of both the question and response. The study team should prepare a list of questions to elicit relevant data. Unlike the questionnaire process, which can better lend itself to the use of statistical techniques in evaluating the data, extensive interviewing may be required before the analyst is satisfied that he or she has an "accurate" picture.

o Examination of Existing Documents. This is a preferred method of fact-finding because it lends itself to quantitative measurement and allows qualitative judgments. It may include an examination of agency regulations, directives, memoranda, previous studies, and similar data, as well as material from outside sources. To save time under certain circumstances, study teams can use statistical sampling to support validity in reviewing records. Records can be used to validate data received from interviews. Some examples of records include regulatory material, correspondence, reports, projects, and travel vouchers.

Section 4. Analyzing Data

1. General. Because each staff study is unique, study teams need to tailor their analysis to each situation. Data analysis refers to the analysis of all the information the study team has collected, including not only numerical data but also opinions, observations, literature reviews, previous reports, and records of performance.

2. Statistical Sampling. Two fact-finding tools available to staff specialists are random sampling and stratified sampling. When a group performs homogenous activity, random sampling can be used within prescribed confidence levels to reflect the total population being sampled. Stratified sampling can also be used when validation is required to ensure diversified elements of the population are represented in the sample.

3. Testing. Consider testing hypotheses in administrative as well as in scientific environments to compare activities. This technique requires careful planning in configuring the test and in measuring the results. It may also be useful in proving the existence of a problem and in comparing optional solutions to problems.

4. Mathematical Models. Analyses frequently require data that does not exist; i.e., future costs and benefits of alternative proposals. Mathematical models can sometimes be used to generate estimates of data that would be observed under hypothetical situations. Before using data generated by such means, assure the model duplicates data observable under current situations. Even if this is the case, it does not mean the model is valid for all situations. Although models are powerful tools, they should not be utilized without a thorough understanding of their methodology and the assumptions built into them.

5. Arranging the Data.

o Form. To facilitate analysis, array data in chart or tabular form whenever possible. This enables the staff specialist to compile data in some logical sequence; for example, chronologically, by size, age, location, year, and region. It also simplifies statistical analysis and facilitates comparisons; for example, between facilities, people, and organizations.

o Exceptions. Look for exceptions to the norm, unusual trends, and configurations that will lead to solutions. More often than not, if the fact-finding is systematic, relevant and the facts have been validated, the solutions will be self-evident.

6. Identifying Causes. Analysis of the data verifies the existence and extent of a problem. Examples of causes include organizational structure, obsolete equipment, inefficient procedures, unwieldy layout, ineffective communication, and lack of training. Without identifying a cause, it is difficult to recommend effective solutions.

7. Conclusions. After considering the problem, facts relating to it, and factors concerning its causes and potential solutions, the study team should be able to formulate conclusions as to the cause or causes of the problem, requirements for a solution, and actions best suited to the situation. The conclusions form the bases for the development and presentation of the next courses of action.

8. Developing Options. All levels of management involved in decisionmaking view a problem and potential solutions from different perspectives based on organizational and interpersonal relationships. What is seen at one level as the one best solution may not be the best in terms of the agency's overall requirements. Therefore, it is necessary to develop several realistic options.

o Listing the Options. If the study has proceeded objectively, the sequencing should not convey the impression of going from strongest to weakest or vice-versa. Each option should be self-contained and the basis for a sequence should be not be discernible. The study team should fully develop the advantages and disadvantages of each. You may also include the "Do Nothing" option.

o Exploring Each Option. This is one of most critical parts of the analysis. It takes the reader through the staff specialist's thought process. Basically, each option has one or more advantages and one or more disadvantages with supporting facts. State these in terms of cost, savings, impact on safety, increased capacity, impact on employees and the public, etc. It is important to address each option objectively without any bias for or against an option.

9. Recommendations. Recommendations are given to the decisionmaker for action and include the potential impact of the action. Whenever possible they should address impact on employees, funds, production, etc. The recommendations might be one of a series of options, a combination of options, or part of an option. The following is a list of four generic situations the staff specialist may consider in making a recommendation:

o A Clear Winner. Demonstrate clearly why the particular course of action is superior to any other course of action.

o No Clear Winner. Separate those options that are equally superior from inferior options.

o Uncertainty. In some cases, the option that is superior depends on information not available at the time; for example, air traffic forecasts. If the missing information can be predicted statistically, a recommendation may be made for the course of action that will produce the most positive anticipated outcome.

o Indeterminate. In some cases the recommendation will depend on information which cannot be predicted statistically. In these cases the decisionmaker could be presented with one option that is superior under certain conditions and another option that is superior if other conditions develop. The decisionmaker will at least have a list of options reduced and can use personal judgment in place of the missing information.

10. Coordination.

o Verification of Facts. The success of the study depends on the accuracy of the data contained in the study. While data can be verified informally, official coordination lends credibility to the documentation. It gives all organizations with an interest in the study an opportunity to review the data supporting the options and recommendations and possibly challenge the study report.

o For Information Purposes. Every organization potentially affected by the study should be informed of the study's objectives and be aware of how the study may impact them. Coordination addresses this requirement.

o For Broader Perspective. Various organizations have differing areas of expertise and differing approaches to problemsolving. Coordination may reveal options that have not been considered and additional information on those options that should be considered.

Section 5. Writing the Report

1. General. Effectively communicating the results of the staff study is vital. The customers of the study should have been identified in the planning stage, but should be reviewed again before the final report is written.

2. Executive Summary. This summary gives the reader an overview of the project and the report and should contain the following paragraphs:

o Purpose. Explain the purpose of the study briefly.

o Problem. Include a brief statement on the problem that initiated the study.

o Major Options. State the major options, why they are considered to be options, and advantages and disadvantages of each.

o Recommendation. State the optimal recommendation(s) with a brief rationalization.

3. List of Recommendations. (Optional) If there are many recommendations, include a list of recommendations after the executive summary. Cross-reference each recommendation on the list with the page where it appears in the report so that the reader can see how the team developed each recommendation.

4. Table of Contents. Use a table of contents for all reports over six pages. The table of contents should follow the list of recommendations. Include all significant headings.

5. Body of Report.

o Introduction. Briefly acquaint readers with the program or activity being studied and provide the following paragraphs:

-- Purpose. State what the objective of the study is and what major areas will be addressed.

-- Scope. State exactly what the study covered in terms of organizations, activities, facilities, etc., depth of the fact-finding, and timeframe within which the study was conducted.

-- Background. Describe any events leading up to the study which affect the problem; that is, changes in management or management's philosophy, planned organizational changes, issuance of new laws and regulations, and introduction of new equipment.

-- Methodology. Describe the approach used in the study to gather and analyze data. Explain how that approach will enhance the report's credibility.

o Assumptions. Assumptions that are applicable and are likely to affect the study's outcome should be listed. Examples include anticipated actions or events as well as "no changes" taking place. Anticipated actions or events include approved planning documents. No one knows for certain that a change will not take place, and the basis for a recommendation may be that the change will not occur. In any case, assumptions are issues the study team accepts and that concerned organizations are likely to accept.

o Facts and Other Considerations. For the purposes of this guide, a fact provides specific information about an operation, activity, organization, condition, or other relevant issues. It must be verifiable or have general acceptance. Examples are policy statements, approved functional statements, and measurable outputs.

-- Coverage. Facts include actual conditions, relationships, events, and similar information, as well as relevant deficiencies regarding the same data. Collectively, they should point to a conclusion but not necessarily include a conclusion.

-- Characteristics. A fact should be significant enough to have direct relevancy to conclusions and recommendations. The study team should not include trivial data. Base facts on hard data rather than opinions and develop them in a logical, unbiased manner that leads to objective conclusions.

o Analysis of Facts.

-- Development. Since most studies are conducted to resolve deficiencies rather than to reaffirm favorable conditions, most facts will generally concentrate on the need for improvement. Each should describe the area needing improvement, measurement tool(s), the cause if possible, and whether it is static, increasing, or decreasing. If charts, tables, and figures will help to support the analysis, include them in the body of the report.

-- Type of Data. This will basically determine the course of the analysis and the availability of techniques for analyzing the data.

- Quantitative Data. Arrange this type of data in tabular and chart form for easier analysis. If the team accumulates enough significant data, it can be used to conduct various statistical analyses.

- Processes. Flow charts and work process charts can be useful in identifying paper flow and the procedural flow of work. Use these analytical tools to identify unnecessary duplication and inefficiencies in work processes.

- Narrative. If possible, use charting techniques. For example, organization charts of two comparable organizations may be more descriptive than a narrative presentation. Even though data is narrative, assemble it in an organized format; that is, chronologically, by size, category, etc.

- Policy Statements and Past Decisions. Analyze these in terms of causal relationships with results and outputs. Use the same analytical tools previously identified.

o Conclusions. Consider the problem, assumptions made concerning it, facts relating to the problem, and causes. From an analysis of these data, the staff specialist should be able to state conclusions concerning

causes and what is required to resolve the problem. The conclusion might also address the likely consequences of leaving the problem unresolved too long.

o Options. If the study did not have previously identified problems and none are discovered, there is no need to suggest additional courses of action. If the study began based on problem identification, or if one surfaces, there will be optional courses of action. One may be to do nothing. State each option clearly and explain it. Normally, a study focuses on one problem. Each additional problem should be addressed using the complete staff study approach.

-- Advantages and Disadvantages. There are advantages and disadvantages for each course of action. State these in the report even though an advantage of one option may be a disadvantage of another option. When developing each option, consider some or all of the following, depending on the deficiency:

- Impact on Safety. Safety is FAA's number one priority. Demonstrate how each option enhances or might derogate safety.

- Costs. Identify both one-time and recurring costs. One-time costs are significant because of their potential magnitude and the fact that budgeting may be limited to one fiscal year. Regardless of the potential long-term savings, it may not be realistic to implement a change which requires high one-time costs in a fiscal year. For guidance in the conduct of cost-benefit and cost-effectiveness analysis, consult the Office of the Financial Services (ABA) and the regional counterparts for costing information.

- Increased Effectiveness and Efficiency. Improvement in effectiveness does not necessarily lead to reduction in costs; however, it may lead to more timely outputs, improved service, and quicker decisionmaking. In serving the aviation public, these can be important advantages to consider. Generally, improved efficiency can be equated with increased productivity. This should mean increased capacity or hard savings.

- Required Changes in Systems, Organizations, and Employees. These changes have a disruptive impact. Spell them out. Regardless of other advantages, the report should advise the decisionmakers of the potential extent of these impacts, which may be of overriding importance.

- Expediency. If remedial action is required immediately, the fact that an action can be implemented quickly is a major advantage of some options. This would be true even though the implementation is only a stop-gap measure.

- Acceptability. Acceptability is important when the success of an implementation depends on the "buy-in" of employees. A successful change will be one that employees see value in.

- Compatibility with Existing Policy. This reduces the obstacles in the implementation process. If policy has to be changed to implement an option successfully, it becomes more difficult to sell the option and to make a timely implementation. Therefore, an advantage of an option would be its compatibility with existing policy.

o Recommendations. Recommendations are given to the decisionmaker for action. If appropriate, they should also indicate who is responsible for implementing the action. Recommendations should also clearly illustrate why the recommended course of action is superior to other courses of action that were considered.

o Appendices and Attachments. Include appendices and attachments when there is detailed information that supports the body of the report but may not be of immediate interest to the reader. Do not include material that the report does not address. Reference each appendix and attachment in sequential order in the body of the report. The following material can be included in an appendix or attachment to a study report:

-- Correspondence requesting the study,

-- The prospectus or plan of action,

-- Relevant directives or excerpts from them and other regulatory material, and

-- Organization charts and staffing tables.

Section 6. Coordination and Approval

1. Coordination.

o With Affected Offices. Give these organizations an opportunity to see the report, validate the data, and to cite flaws in the analysis. This may gain early support for recommendations.

o With Interested Offices. Most studies have a potential impact on agency resources and may require coordination with the budget and human resource organizations. Discuss with your customer the advantages of coordinating the report with any organization whose program is affected by the study.

o Disposition of Comments. Process comments in the same way the agency coordinates comments on a proposed directive. Summarize those not accepted with reason(s) for non-adoption of recommended changes.

2. Approval Methods.

o Letter of Transmittal. This contains the recommendation(s) requiring action and request for official approval.

o Executive Summary. If there are only a few recommendations, include them in the executive summary (may include approval or disapproval lines).

o Multi-Office Recommendations. Indicate after each recommendation who the approving official is for each individual recommendation. Annotate who has the action for implementing the specific recommendation(s).

3. Sensitivity of Reports. The staff study report is the final product delivered to the customer by the study team. The team should ensure that only those offices directly impacted by the study, or other offices as determined by your customer, have access to the report. The study team may elect to stamp or otherwise mark the report "For Official Use Only," to safeguard the

information contained in the report. However, be advised that under the Freedom of Information Act (FOIA), study reports and other data may be obtained by individuals who would not otherwise have access to them. Please contact the Freedom of Information Act (FOIA) Staff (AAD-40) for additional guidance as needed.

4. Paperwork Reduction Act. Under this Act the agency cannot survey or collect data from more than nine non-Federal individuals without prior approval from the Office of Management and Budget. However, this Act should not directly impact the gathering of data for study efforts since the data sources normally come from within the agency. Please contact FAA's Public Reports Officer (ABC-100) for additional guidance as needed.

APPENDIX A. DEFINITIONS

1. Appraisal. Most often refers to an assessment of management and organizational issues often crossing organizational or programmatic lines.

2. Charter. Documents the agreement between the evaluation or study team performing a review and the customer requesting the review. The charter includes information on the objective of the review, scope, commitment of resources, and milestones for conducting and completing the review. Also referred to as a prospectus.

3. Cost-Benefit Analysis. A formal procedure for comparing the costs and benefits of alternative actions. Most often used when there is a tangible, measurable monetary return that can be computed for the action.

4. Cost-Effective Analysis. A type of analysis that identifies either the lowest cost approach to achieve a given result or an approach that produces the highest positive results for a given amount of resources.

5. Evaluation. An assessment, through objective measurement and systematic analysis, of the manner and extent to which agency programs and activities achieve intended objectives, manage resources, or comply with regulatory or legislative requirements.

6. Methodology. A regular, ordered, and logical procedure for collecting and analyzing the data needed to answer questions posed in a review process, such as an evaluation, appraisal, or staff study.

7. Model. Representations of complex relationships that are used to describe a situation or an environment. Once a model is constructed, the effects of changes in the assumptions used to construct the model can be observed. A flowchart is a good example of a simple, useful model.

8. Prospectus. Documents the agreement between the evaluation or study team performing a review and the customer requesting the review. Includes information on the objective of the review, scope, commitment of resources, and milestones for conducting and completing the review. Also referred to as a charter.

9. Recurring Cost. The annual cost resulting from the change; for example, the cost of maintaining a new building or road.

10. Recurring Saving. A decrease in the annual recurring cost resulting from a change.

11. Sampling. A procedure that can be used to gather data from a large population (more than one hundred). A statistician can help determine the sample size necessary.

12. Staff Specialist. An individual assigned to a staff study with principal duties consisting of providing advice and support to management.

13. Staff Study. Any undertaking requiring data collection, data analysis, and its objective presentation in a form to facilitate effective decisionmaking by management.

14. Statistics. An area of mathematics seeking to make order out of collections of diverse facts or data.

15. Trend. A pattern of consistent findings (regarding a program) that occur across evaluations or studies or that are derived from a variety of data sources regarding a program's operations, costs, or impacts over a period of time.

16. Trend Analysis. Feedback and information about program directions and the implementation of evaluation or study recommendations.

APPENDIX B. SAMPLE PROSPECTUS OR CHARTER

At a minimum, a prospectus or charter should contain the following data and signatures.

Background: Describe why the evaluation, appraisal, or study (hereinafter referred to as study) is being done and what issue led to the study.

Purpose: Describe the specific question(s) the study will address and for what operational purpose. Discuss the decisions and actions dependent on the findings.

Scope: Explain the boundaries of the study and the type of data that will be collected. Describe the time period, geographical area, organizational units, activities, etc., that will be studied.

Methodology: Describe the approach for gathering and analyzing the data.

Staff Responsibilities: Address the roles and functions required to perform the study and the anticipated time period for such commitment. Address any other resources that may be required; for example, materials, facilities, etc.

Schedule: Provide the anticipated milestones for achieving the planned actions.

Estimated Cost: Address any anticipated costs associated with the effort; for example, travel that may be required to gather data.

Signature/date
Customer

Signature/date
Team Leader

Signature/date
Head of Consultant Organization

APPENDIX C. SAMPLE EVALUATION REPORT FORMAT

The following sample illustrates the basic paragraphs that should appear within a final report.

Executive Summary: Provide a brief overview of the program, function, or activity reviewed, how the effort was conducted, and the major findings and recommendations.

Introduction: Explain the specific questions addressed by the effort.

- **Background:** Outline the history of the program and the legal or regulatory mandate giving the authority for the organization or program.

- **Objectives:** Describe the key questions the effort was designed to address.

- **Scope:** Explain where and when the team conducted the effort. Describe the procedures and the amount of activity that was studied.

- **Methodology:** Explain the approach used to collect data and come to conclusions. Avoid technical jargon but explain any statistical tests used in the review effort. Discuss any limitations of the methodology used.

Findings: Present findings as clear statements supported by analysis. Emphasize any positive findings. When describing negative findings, present them as "opportunities for improvements."

Recommendations: Present recommendations clearly, show how they are supported by the findings drawn from data analysis, and illustrate how they can improve the program, function, or activity reviewed.

Appendices: Place information that is too technical or lengthy for the body of the report within an appendix.

APPENDIX D. SAMPLE STAFF STUDY REPORT FORMAT

The following sample illustrates the basic paragraphs that should appear within a final report.

Executive Summary: Provide a brief overview of the project and the report. Some key items of interest from the study can be included.

Introduction/Purpose: Explain the basis for the effort.

Assumptions: Describe future conditions upon which the success of the solution depends. Valid assumptions become the major risk variables associated with recommended solutions made in the staff study process.

Facts and Other Considerations: Present all relevant information in an objective and balanced manner.

Analysis of Facts: Provide an analysis of the facts to reach conclusions as to the cause of the problem and to initiate the development of ideas or feasible solutions that will eliminate or reduce the cause of the problem. This analysis will provide the basis against which the judgment of the options or courses of action will be made.

Conclusions: Provide short, concise statements of the implications for the problem and its solution based on the findings. Summarize the facts and analyses that lead to selection of the best option.

Options: Discuss the viable courses of action that would solve or alleviate the problem.

Recommendations: Spell out the action(s) necessary to implement the selection option and explain why it is "best."

Appendices and Enclosures: Place information that is too technical or lengthy for the body of the report in an appendix.

ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

1800.2G

10/3/96

SUBJ: **EVALUATIONS, APPRAISALS, AND STAFF STUDIES**

1. PURPOSE. This order prescribes policy, assigns responsibilities, and provides requirements regarding the evaluation, appraisal, and study of agency programs and activities.

2. DISTRIBUTION. This order is distributed to division levels in the Washington headquarters, regions, and centers with a limited distribution to all field offices and facilities.

3. CANCELLATION. This order cancels the following:

a. Order 1800.2F, Evaluation and Appraisal of Agency Programs, dated November 8, 1991.

b. Order 1800.7B, Staff Studies, dated October 29, 1985.

4. BACKGROUND. On April 2, 1995, the responsibility for establishing the policy and procedures for evaluations, appraisals, and staff studies was transferred to the newly created Office of Business Information and Consultation (ABC).

5. EXPLANATION OF CHANGES. This revision:

a. Addresses the conduct of staff studies which was formerly contained in Order 1800.7B, Staff Studies, including responsibilities and designation of a focal point.

b. Deletes the formal annual reporting requirements for evaluation schedules and accomplishments and establishes new procedures for collecting, maintaining, and sharing this information throughout the agency.

c. Reflects the supportive and consultative roles of the Office of Business Information and Consultation regarding agencywide evaluations, appraisals, and studies.

6. DEFINITIONS.

a. An evaluation usually refers to an assessment, through objective measurement and systematic analysis, of the manner and extent to which agency programs and activities achieve intended objectives, manage resources, or comply with regulatory or legislative requirements.

b. An appraisal usually refers to an assessment of management and organizational issues often crossing organizational or programmatic lines.

c. A staff study usually refers to the gathering and reporting of specific information for management decisions.

7. **POLICIES.** All agency organizations should manage programs, activities, and resources effectively, efficiently, and in accordance with regulatory and legislative requirements. Review processes, such as evaluations, appraisals, and studies, can be the basis for continuous performance, effectiveness, and efficiency improvements. Additionally, the Government Performance and Results Act of 1993 places increased emphasis on program evaluations for use in establishing or revising an agency's goals and objectives and measuring an agency's performance against them.

8. **RESPONSIBILITIES.**

a. The Associate Administrator for Administration (AAD-1) serves as the principal agency advisor to the Administrator on policies governing the evaluation, appraisal, or study of programs and activities agencywide.

b. The Office of Business Information and Consultation:

(1) Develops and issues policy and guidance for conducting agencywide evaluations, appraisals, and studies.

(2) Provides coordination as required to ensure the effective overall agency operation of these review efforts.

(3) Acts as a consultant to FAA organizations considering or conducting evaluations, appraisals, or studies.

(4) Participates in evaluations, appraisals, and studies as required.

(5) Conducts independent evaluations, appraisals, and studies as requested.

(6) Serves as the agency's training resource for these review efforts.

(7) Maintains a data base containing information on agencywide evaluations, appraisals, and studies; tools used in conducting such efforts; and benchmarking. The data base will facilitate the exchange of information among evaluators throughout FAA.

(8) Requests evaluation, appraisal, or study data periodically from organizations for inclusion in the ABC data base as referenced in paragraph 8b(7).

(9) Assesses customer needs continuously.

c. Assistant Administrators, Associate Administrators, and Heads of Offices, Services, Regions, and Centers:

(1) Ensure that a system for planning, conducting, and following up on evaluations, appraisals, and studies exists within their areas of responsibility.

(2) Plan and conduct evaluations, appraisals, and studies as needed; for example, to establish linkages between programs and their intended outcomes in accordance with the Government Performance and Results Act; to assess the overall effective achievement of program objectives, the efficient use of agency resources, and the level of customer satisfaction; and to determine compliance with laws, regulations, and other statutory requirements.

(3) Designate focal points for these review processes (evaluations, appraisals, and studies) in writing and provide the names, telephone numbers, and routing symbols of these officers to the Office of Business Information and Consultation.

d. Each focal point will serve as a liaison between ABC and the focal point's organization. As such, the focal point will provide for overall planning, guidance, and coordination of evaluation, appraisal, and study efforts within his or her organization.

9. PROCEDURES. Guidance for planning and performing evaluations, appraisals, and studies is contained in the Evaluation, Appraisal, and Staff Study Guide. Copies are available from ABC-200 and are provided to attendees of the training sessions conducted by the agency.

David Hinson

David R. Hinson
Administrator